

Applicant : Vladimir Andreevich Bushuev  
Serial No. : 09/649,431  
Filed : August 25, 2000

d) Remarks:

Reconsideration and allowance of the present application in view of the foregoing amendments and accompanying remarks are respectfully requested.

Claims 6 and 7 were pending. In this Amendment claims 6 and 7 are being cancelled and claim 8 is being added. Claim 8 is pending.

In the Office Action dated May 9, 2003, the Examiner stated that the Amendment filed February 25, 2003 is objected to under 35 U.S.C. 132 because it allegedly introduces new matter into the disclosure. The Examiner stated that the material which is not supported by the original disclosure is as follows: the term and definition of a "ring-like shaped cavity" as well as the assertion that Fig. 3 demonstrates a torid-like cavity with two semi-cavities. The Examiner stated that applicant is required to cancel the new matter in the reply to this Office Action.

The Examiner rejected Claims 6 and 7 under 35 U.S.C. 112, first paragraph, as allegedly failing to comply with the written description requirement. The Examiner stated that the claim(s) contain subject matter which was allegedly not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The Examiner stated that the recitation of a "ring-shaped vortex-flow cavity" (claim 6) and "two ring-shaped vortex-flow cavities" (claim 7) are not supported by the specification or drawings and the Examiner holds that such recitations in the claims are new matter.

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The Examiner stated that claim 6 is rejected under 35 U.S.C. 102(b) as being anticipated by Dinulescu (4,265,732). The Examiner stated that Dinulescu discloses an apparatus comprising: a bladed (3) working wheel (2); a cascade of stationary blades (4); a hollow housing (5); an inlet nipple (see fig. 2a) for supplying feedstock (col. 5, line 42); an outlet nipple (see fig. 2a) for carrying-off cracked gas (see abstract); wherein said working wheel and said cascade of stationary blades are located in said housing (see fig. 2a) to form a ring-shaped vortex-flow cavity for recirculation of pyrolyzed gas (col. 3, lines 1-7); and wherein said inlet nipple and said outlet nipple are in communication with said cavity (see fig. 2a).

The Examiner stated that claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Dinulescu (4,265,732). The Examiner stated that Dinulescu discloses an apparatus comprising: a bladed (3) working wheel (2); a cascade of stationary blades (4); a hollow housing (5); an inlet nipple (see fig. 2a) for supplying feedstock (col. 5, line 42); an outlet nipple (see fig. 2a) for carrying-off cracked gas (see abstract); wherein said working wheel and said cascade of stationary blades are located in said housing (see fig. 2a) to form a ring-shaped vortex-flow cavity for recirculation of pyrolyzed gas (col. 3, lines 1-7); and wherein said inlet nipple and said outlet nipple are in communication with said cavity (see fig. 2a).

The Examiner stated that Dinulescu is silent as to providing two cavities, but it has been held that to duplicated (sic) parts for a multiplied effect is not the type of innovation for which is a patent monopoly is to be granted. The Examiner stated that it would have been obvious to one of ordinary skill in the art at the

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time the invention was made to provide multiple cavities in order to achieve a multiplied effect for operation of the apparatus, citing St. Regis Paper Co. v. Bemis Co., Inc., 193 USPQ 8, 11 (7<sup>th</sup> Cir. 1977).

The Examiner stated that applicant's arguments filed February 25, 2003 have been fully considered but they are not persuasive. The Examiner stated that applicant argues that Dinulescu does not provide the presently claimed "ring-like shaped cavity which allows creation of a ring vortex flow inside the cavity" as apparent after study of figure 2b of the reference.

The Examiner stated that the Examiner respectfully disagrees with applicant. The Examiner stated that Dinulescu does indeed illustrate of a ring-like cavity in figure 2a of the reference and discloses wherein the apparatus creates vortices in the apparatus (col. 2, line 61-col. 3, line 7).

In response to the Office Action, without canceling the correctness of the Examiner's decision, but solely to advance prosecution, claims 6 and 7 are being cancelled and new claim 8 is being added. Support for claim 8 may be found, inter alia, in Fig. 3 as originally filed. Support for the term "vortex ring" may be found on p.10.

The presently claimed invention provides a blading rotary reactor having an annular cavity which allows creation of a "vortex ring" of reactants inside the cavity. This vortex ring ensures practically instant heating hydrocarbons feed to pyrolysis temperature.

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In the present application the term "vortex ring" (page 10 of the original specification) is used for characterization of a flow in an annular cavity formed by a working wheel, stationary blades and a housing - the flow which appears when the working wheel is rotating. This wording is used in exact accordance with terminology accepted in Fluid Mechanics and means a vortex, a core of which is twisted into ring. Thus a word "ring" relates to the shape of this vortex core. The following is accepted definition of wording "vortex ring".

ring vortex, vortex ring: An isolated vortex with toroidal core, formed by a set of circular vortex lines, whose centres lie on a common axis and whose planes are perpendicular to it.

The following is accepted definition of wording "vortex core".

vortex core, whirl core:

A liquid or gaseous region forming the central part of a vortex and behaving as a rigid body. (See A. T. Troskolanski, VOCABULARY OF MECHANICS in five languages, Volume 2, group 15. MECHANICS OF FLUIDS, PERGAMON Press, Warsaw, 1967, pp. 40, 41, attached hereto as Exhibit A).

For visual perception applicant submits images of vortex having different shapes of a core from the book by L.G. Loitsyansky "Fluid and Gas Mechanics, Nauka, Moscow 1973, p. 62, attached hereto as Exhibit B. Five vortices are shown in Fig. 9 and only one of them is vortex ring, indicated by the arrow added by applicant. Blading rotary devices in which a vortex ring is created in working cavity are well known to those skilled in the art of Applied Fluid

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Mechanics. The vortex-flow drives (US Cl. 192/3,21, 3.34) relate to such blading rotary device. For example US Patent 3,537,262 attached as Exhibit C, describes hydrodynamic torque converter, which comprises a housing filled with a liquid and also an impeller, turbine and stator arranged in toroidal fluid flow relationship. The impeller, turbine and stator are provided with blades and form an annular cavity so that when the impeller is rotated the liquid recirculates in this cavity creating a vortex ring. The vortex ring provides effective transfer of a torque from impeller to liquid filling the working cavity. Devices of such structure are used in vehicles.

The design of Dinulescu's apparatus of U.S. Patent No. 4,265,732 is an axial multistage blading machine of a conventional type (Fig. 2a). Each stage of this apparatus includes axial-flow impeller or axial flow runner. The following is accepted definition of these wordings:

Axial-flow runner, axial-flow impeller: A rotor in which the fluid filaments form cylindrical surfaces concentric with the rotor axis. (See A. T. Troskolanski, VOCABULARY OF MECHANICS in five languages, Volume 2, group 15. MECHANICS OF FLUIDS, Pergamon Press, Warsaw, 1967, p. 145, part of Exhibit A)

A toroidal vortex core is a feature of vortex ring and it is absent in Dinulescu's apparatus. The fluid in Dinulescu's apparatus flows without formation of vortex ring. Applicant has not found any disclosure in Dinulescu's patent specification or drawings of an annular cavity for hot cracked gas recirculation in which a vortex ring is created when working wheel is rotated.

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Thus there are essential distinctions between the reactor submitted by applicant and Dinulescu's apparatus, namely: housing and working wheel of new reactor form an annular cavity containing directing stationary blades and blades of working wheel, so that hot pyrolyzed gas is recirculated in this cavity forming a "vortex ring" when working wheel is rotated.

In view of the foregoing, applicant believes that the present claim 8 distinguishes patentably over the cited reference, and allowance is earnestly solicited.

If a telephone interview would be of assistance in advancing prosecution of the subject application, the undersigned attorney invites the Examiner to telephone him at the telephone number provided below.

No fee is deemed necessary in connection with the filing of this Amendment. If any additional fee is necessary, authorization is hereby given to charge the amount of any such fee to Deposit Account No. 03-3125.

Respectfully submitted,

I hereby certify that this correspondence is being deposited this date with the U.S. Postal Service with sufficient postage as first class mail in an envelope addressed to:

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